THE NEWS LETTER
OF THE
BUREAU OF PUBLIC ROADS

VOL. 3, NO. 7 MAY, 1928 A. C. ROSE, EDITOR

CONTENTS

CONCRETE FINISHER USED SUCCESSFULLY ON ROCK-ASPHALT-SURFACING PROJECT

COMPILED FROM REPORTS SUBMITTED BY J. S. LOGAN OF DISTRICT 6 AND C. L. DONOVAN OF THE DIVISION OF MANAGEMENT

(NOT FOR RELEASE)

A LAKEWOOD CONCRETE-PAVEMENT FINISHING MACHINE, SHOWN IN THE ACCOMPANYING PHOTOGRAPHS, WAS USED SUCCESSFULLY FOR SPREADING THE ROCK-ASPHALT SURFACING ON OKLAHOMA FEDERAL-AID PROJECT #75, IN HUGHES COUNTY. THE PAVEMENT CONSISTED OF A $1\frac{1}{2}$-INCH ROCK-ASPHALT SURFACING ON A $9\frac{1}{2}$-5-$9\frac{1}{2}$ THICKENED-EDGE TYPE CONCRETE BASE WITH CONCRETE CURBS 9 INCHES WIDE AND $1\frac{1}{2}$ INCHES IN HEIGHT.

AFTER THE FIRST 2 MILES OF THE TOP COURSE HAD BEEN LAID BY THE USUAL HAND-RAKING METHOD, IT WAS DECIDED TO TRY OUT THE CONCRETE-PAVEMENT FINISHER. ONLY A FEW MINOR CHANGES WERE MADE IN THE MACHINE. THESE INCLUDED LOWERING THE SCREED PLATES 3/4 OF AN INCH BELOW THE POSITION USED WHEN FINISHING CONCRETE, AND A CHANGE IN THE POSITION OF THE WHEELS ON THE AXLE SO THAT THEY RIDE ON THE CONCRETE CURBING, INSTEAD OF ON THE METAL FORMS. WITHOUT MAKING RADICAL CHANGES IN THE WHEELS OR AXLES IT WAS NOT POSSIBLE TO MAKE AN ENTIRELY SATISFACTORY ADJUSTMENT OF THE GAUGE, BUT ENOUGH WAS TAKEN UP SO THAT, WITH CARE ON THE PART OF THE OPERATOR, THE MACHINE COULD BE KEPT ON THE CURBS. A LARGE GASOLINE TORCH WAS EMPLOYED TO HEAT THE SCREED EACH MORNING, AND AT OTHER TIMES WHEN THERE WAS A LAPSE IN THE DELIVERY OF THE HOT-STUFF. AN ATTEMPT WAS MADE TO USE THE TAMPER AND A METAL-FACED WOODEN BELT, BUT BOTH OF THESE WERE DISCARDED LATER.

PRIOR TO THE USE OF THE MACHINE, IT HAD BEEN NECESSARY TO MAKE A NUMBER OF SKIN PATCHES ON UNEVEN PORTIONS OF THE SURFACE. THESE LATER SCALED OFF AND LEFT THE PAVEMENT IN A ROUGH AND UNSATISFACTORY CONDITION. THE MACHINE ELIMINATED ENTIRELY THE NECESSITY FOR SKIN PATCHING. AFTER THE INITIAL ROLLING, VARIATIONS OF 1/8 OF AN INCH WERE SELDOM FOUND UNDER A TEN-FOOT STRAIGHT EDGE.

Machine Should Reduce Labor Costs Considerably

With the use of the machine it is believed that the cost of labor may be reduced considerably. Five rakers at 75 cents an hour were employed for spreading the asphalt surface by hand. Two common laborers at 40 cents an hour could replace the 5 rakers when the finishing machine is used, and the crew could be cut to the following men: 1 foreman, 2 roller men, 1 finishing-machine operator, 2 slab sweepers, 6 shovelers, 2 puddlers, and 1 cement-dust sweeper. Twenty-four men were employed on the road when the raking was accomplished by hand.

For seven days during one week the machine spread an average of 2,863 square yards of surfacing, and on one day reached a maximum of 3,111 square yards in $9\frac{1}{4}$ hours with the plant mixing 1,200-pound batches. Another set of burners was then installed on the plant and it was hoped that the production could thus be increased to 3,600 square yards of surfacing or better per day. The finishing machine travelled at the rate of $7\frac{1}{2}$ feet a minute, in low gear, and could handle a 3,600-pound load every 2 minutes.

At the beginning of the work, the bituminous material was dumped, spread, and raked a trifle high ahead of the finishing machine (fig. 1). The finisher was then run over the surface, striking off and carrying the excess material ahead in its forward movement (fig. 2).

When the screed was at the proper temperature, a fairly good seal was obtained prior to rolling (fig. 3). After the screed had been used successfully, an attempt was made to use the tamper, but unless heated to the proper temperature, it would pick up the hot-stuff and spoil the seal made by the screed. The tamper was, therefore, discarded because of the difficulty of maintaining it at the desired temperature. A light screed or belt was then devised and attached to the rear of the machine, where the original belt was attached. This screed was made by kerfing a 10-inch board nearly through on one face, to make it flexible, and then covering the belting face with sheet iron. This contrivance was heated with a torch, before starting work. Once hot, the wooden backing served as an insulator and prevented cooling so that the heat of the surfacing material was sufficient to maintain a satisfactory temperature on the working face. This device worked satisfactorily and sealed portions of the surface left open because of the uneven heating of the screed; but, when it was accidentally broken, it was not replaced.

Fig. 1. - Shoveling the hot-stuff against the screed as the finishing machine advances

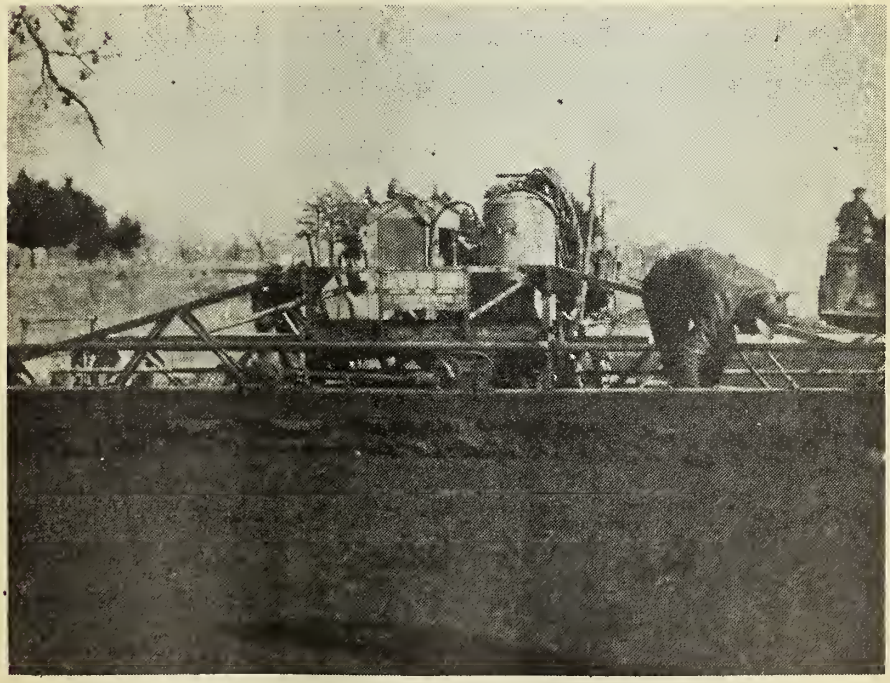


Fig. 2. - Screed pushing excess material ahead, after hot-stuff had been previously spread and raked

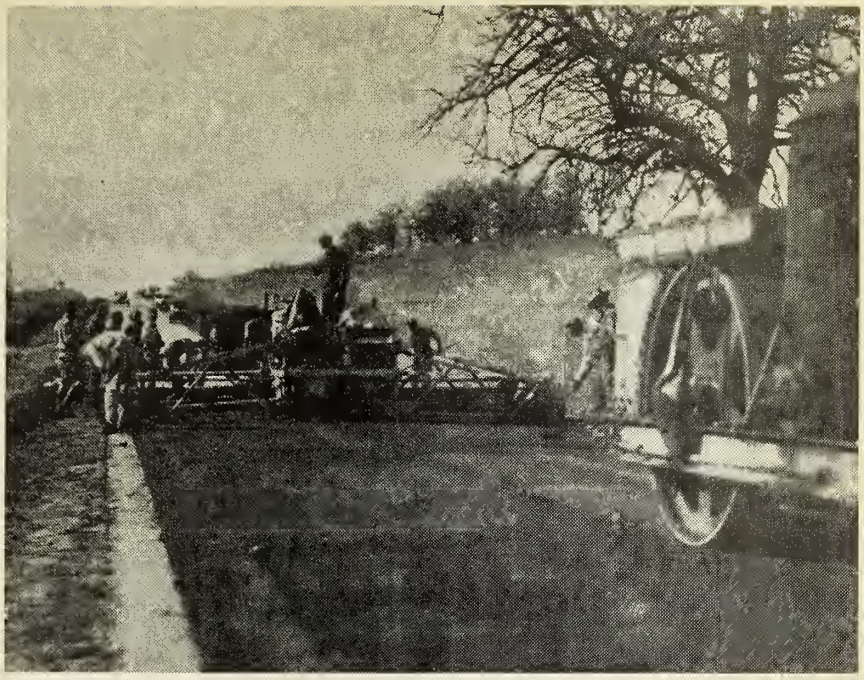


Fig. 3. - Initial compression under an 8-ton roller

Fig. 4. - The surface was completely sealed by the roller

More Uniform Density Obtained By Spreading Excess of Surfacing Material With Shovels

As the work progressed it was found that a more uniform density could be obtained by omitting the raking and having the material spread by the shovelers so as to maintain a greater surplus ahead of the screed board. This conclusion was reached by testing the machine-finished surface with a hand rake. When the material had been hand-raked ahead of the finisher, the rake would detect soft and hard areas. With the raking omitted and a greater excess of shoveled material ahead of the screed there was a more uniform resistance to the testing rake.

In warm, calm weather the heat transferred from the surfacing material kept the screed board at the proper temperature with only occasional applications of the torch. On cold and windy days, however, it became necessary to ignite kerosene frequently on the top of the screed board to maintain a suitable working temperature.

The character of the surface obtained with the finisher was very satisfactory (fig. 4). A better and more uniform seal was obtained than was possible with the old hand-raking method, and when the screed was kept at the proper temperature, a very satisfactory seal was in evidence even before any rolling was begun. In riding over the machine-finished sections it was apparent that the surface was smoother than that on the hand-raked sections. The smoothness of the finished pavement is of course controlled by the smoothness of the top of the concrete curbs.

It is also believed that a greater density of the finished surface was obtained on the machine-finished than on the hand-raked sections; the specific gravity of pavement samples in the first case averaging 2.171, as compared with an average of 2.156 for the latter.

Machine Faster Than Hand-Raking Method

Production was also increased considerably by the finishing machine. It required 13 days to lay the first 2 miles with hand raking. The second 2 miles, laid with the machine, was finished in a little less than 7 days. This result was accomplished at the time when experiments were being made

WITH THE MACHINE. A COMPARISON OF THE PRODUCTION ON THE REMAINDER OF THE PROJECT WAS NOT POSSIBLE BECAUSE OF THE LIMITED OUTPUT OF THE PROPORTIONING PLANT.

ALTHOUGH THE CONTRACTOR RETAINED HIS HAND-RAKING ORGANIZATION ON THE JOB WHILE THE EXPERIMENTS WITH THE MACHINE WERE IN PROGRESS, IT IS BELIEVED THAT THE FORCE COULD HAVE BEEN CONSIDERABLY REDUCED, AS HAS BEEN PREVIOUSLY MENTIONED. IT SHOULD BE POSSIBLE ALSO TO BREAK IN A GREEN CREW FOR THE MACHINE IN A COMPARATIVELY SHORT TIME, WHEREAS EXPERIENCED MEN ARE REQUIRED FOR HAND RAKING.

IT WAS THE CONCENSUS OF OPINION OF THOSE OBSERVING THE EXPERIMENTS THAT WITH AN INSULATED HEATING DEVICE, FOR MAINTAINING A UNIFORM TEMPERATURE ON THE SCREED BOARD; AND WITH SOME CONTRIVANCE TO COMPLETE THE SEAL, PLACED WHERE THE BELT IS ORDINARILY ATTACHED; THAT THE CONCRETE FINISHING MACHINE WOULD ELIMINATE THE OLD HAND-RAKING METHOD. IT IS BELIEVED THAT THE ADDITIONAL PARTS COULD BE DESIGNED AS ACCESSORIES SO AS TO MAKE THE FINISHING MACHINE ADAPTABLE EITHER TO CONCRETE OR BITUMINOUS PAVEMENTS.

THE ROAD ON WHICH THE EXPERIMENTS WERE MADE IS BEING CONSTRUCTED BY THE H. L. CANADY CONSTRUCTION COMPANY OF TULSA, OKLA., UNDER THE SUPERVISION OF GUY JAMES, RESIDENT ENGINEER FOR THE STATE HIGHWAY DEPARTMENT.

UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF PUBLIC ROADS

STATUS OF CURRENT FEDERAL-AID ROAD WORK

FOR THE FISCAL YEAR ENDING JUNE 30, 1928

AS OF APRIL 30, 1928

STATES	BALANCE OF FEDERAL-AID FUND AVAILABLE FOR NEW PROJECTS	*UNDER CONSTRUCTION			APPROVED FOR CONSTRUCTION			AMOUNT PAID STATES DURING FISCAL YEAR	COMPLETED AND PAID DURING FISCAL YEAR			AGREEMENTS NOW IN FORCE			P. S. & E. RECOMMENDED FOR APPROVAL BY DISTRICT ENGINEER			STATES
		FEDERAL AID	MILEAGE		FEDERAL AID	MILEAGE			FEDERAL AID	MILEAGE		FEDERAL AID	MILEAGE		FEDERAL AID	MILEAGE		
			ORIGINAL	STAGE		ORIGINAL	STAGE			ORIGINAL	STAGE		ORIGINAL	STAGE		ORIGINAL	STAGE	
Alabama	$ 2,107,950.69	$ 3,718,585.21	408.2	57.8	$ 222,863.69	35.1		$ 2,027,633.99	$ 1,779,658.47	205.3		$ 3,128,768.70	368.4	26.5	$ 512,680.20	74.9	3[illegible].2	Alabama
Arizona	3,951,256.08	792,923.07	65.7	4.4	58,152.85	0.5	0.5	353,395.57	483,822.73	16.1		810,187.51	65.9	5.0	40,888.41	0.8		Arizona
Arkansas	1,937,085.58	2,190,536.90	246.0		419,747.00	32.8		414,723.96	92,922.87	18.4		2,269,144.68	222.5		341,139.12	56.2		Arkansas
California	4,221,618.78	3,343,846.72	144.4	6.2	234,781.25	15.7	2.0	1,960,779.23	2,275,393.43	114.9	0.4	3,061,571.05	139.2	5.2	516,956.92	20.9	2.0	California
Colorado	2,957,113.80	2,804,062.68	206.4	9.1	579,524.55	50.3		1,135,097.06	810,733.06	83.0	3.2	2,814,344.77	213.4	9.1	569,242.45	43.2		Colorado
Connecticut	605,113.52	1,363,375.53	57.4		190,461.17	11.9		339,386.23	677,628.04	35.3		1,471,694.05	63.9		82,142.75	5.4		Connecticut
Delaware	167,579.97	209,908.50	11.3	3.9	178,396.27	12.9		303,850.84	303,850.94	34.4		189,191.47	11.3	2.7	199,113.30	12.9	1.9	Delaware
Florida	1,325,672.07	2,321,911.03	141.2	5.5	387,752.10	27.8		1,065,955.61	2,222,468.20	94.6	24.7	2,110,171.12	114.8	5.5	599,492.01	54.2		Florida
Georgia	721,485.61	2,457,229.44	207.0	60.7	756,767.55	59.3	30.2	1,825,072.54	3,354,462.00	249.0	121.0	2,036,430.42	177.5	41.5	1,177,556.57	88.7	49.3	Georgia
Idaho	498,014.22	1,175,126.55	131.2	41.7	497,114.77	49.5	14.7	809,188.52	1,182,999.30	136.2	34.1	765,773.90	89.9	11.5	807,487.42	9[illegible].8	44.5	Idaho
Illinois	1,395,898.02	7,298,909.27	500.4		3,732,802.31	250.9		2,382,487.72	912,726.80	68.0		6,783,402.48	474.7		4,248,309.10	276.5		Illinois
Indiana	555,950.97	5,955,479.23	379.0		1,564,281.93	122.1	3.5	1,868,266.44	2,637,309.87	177.1		5,912,348.30	382.9	3.5	1,708,412.75	115.2		Indiana
Iowa	310,965.56	2,902,654.76	172.3	128.2	1,430,053.09	22.4	93.5	3,153,571.64	4,625,565.74	449.2	116.4	3,831,434.00	192.1	209.9	401,283.95	12.6	11.6	Iowa
Kansas	2,180,307.39	4,092,831.95	503.6	3.9	52,000.00	10.3		2,743,438.90	2,539,170.18	389.5	13.9	4,127,331.95	508.7	3.6	17,500.00	5.2		Kansas
Kentucky	781,391.55	3,571,321.26	321.1	38.3	548,681.72	62.2		2,040,089.10	1,539,695.72	156.2	41.1	3,497,229.64	312.7	38.3	722,773.34	70.6		Kentucky
Louisiana	377,532.87	3,015,763.34	227.1	7.5	199,327.13	17.7		651,905.28	518,382.45	51.7		2,519,986.25	190.3	7.5	595,124.22	64.5		Louisiana
Maine	1,628,296.04	453,994.44	33.9		155,563.09	14.1		469,884.25	732,745.75	61.7		497,950.44	38.5		111,507.09	8.5		Maine
Maryland	380,673.28	300,775.05	29.0		275,900.00	23.7	7.2	555,306.53	712,794.40	73.5		253,576.05	29.0		323,100.00	23.7	7.2	Maryland
Massachusetts	2,509,297.98	1,897,913.60	117.7		113,933.45	6.9		339,557.92	339,557.92	22.4		1,929,416.50	119.8		92,433.45	4.5		Massachusetts
Michigan	800,093.27	4,521,210.31	270.5		2,274,312.00	132.9	8.5	2,094,799.40	2,742,551.43	195.5	12.5	4,029,339.81	249.2		2,965,182.50	154.2	6.5	Michigan
Minnesota	507,471.43	1,334,100.00	258.5	3.9	538,000.00	85.4	71.4	1,986,835.11	2,001,398.90	248.7	110.2	2,075,100.00	341.5	52.0	195,000.00	0.5	12.5	Minnesota
Mississippi	1,046,316.79	2,653,208.34	246.4	16.8	422,735.29	40.7	26.4	1,542,991.55	1,510,089.97	188.0	15.0	2,207,783.36	230.8	16.9	878,181.27	56.3	26.4	Mississippi
Missouri	2,010,685.98	2,739,441.05	205.6	17.8	876,299.93	72.5	33.5	2,404,825.15	2,199,504.76	171.9	30.3	2,712,291.87	212.2	17.8	1,002,449.01	65.9	33.5	Missouri
Montana	4,691,764.56	2,590,980.75	317.2	4.1	1,329,464.39	243.1	1.3	1,406,158.47	529,471.62	69.2	9.2	3,190,393.95	439.5	5.4	540,051.26	120.5		Montana
Nebraska	1,942,823.01	5,209,200.70	1,022.5	400.4	154,167.91	30.7	34.9	2,268,628.55	2,759,675.99	590.0	472.3	5,298,258.02	1,053.2	421.5	55,110.59		13.9	Nebraska
Nevada	845,218.50	1,562,951.02	200.1	29.6	125,003.09	8.5	32.4	752,061.43	579,379.71	80.9	10.7	1,614,310.51	208.7	31.3	73,543.50		30.7	Nevada
New Hampshire	210,613.71	363,909.51	22.3		159,472.92	7.7		331,552.20	387,917.71	29.1		357,242.73	22.3		156,139.80	7.7		New Hampshire
New Jersey	412,792.00	837,301.52	54.9		482,565.00	33.9		1,109,130.00	1,109,130.00	73.9		797,536.52	52.2		522,330.00	36.5		New Jersey
New Mexico	2,041,431.66	2,255,180.28	182.2		221,885.53	25.9		1,250,203.49	982,413.37	99.9		2,368,049.08	195.1		115,017.83	12.9		New Mexico
New York	5,438,357.47	9,432,726.45	588.4		1,830,652.50	119.5	8.6	3,926,894.18	2,914,598.93	188.4		10,502,778.95	663.9	8.5	550,500.00	44.1		New York
North Carolina	1,505,951.93	934,448.18	39.2	24.9	807,264.14	54.4	7.5	1,225,730.73	1,479,904.59	116.9	9.7	825,448.18	39.2	24.9	816,264.14	64.4	7.5	North Carolina
North Dakota	875,559.41	1,752,307.25	564.7	150.2	709,521.03	258.3	204.1	1,243,598.75	2,054,158.52	488.9	342.1	2,021,135.27	568.5	241.9	439,753.02	154.2	112.4	North Dakota
Ohio	3,307,111.49	3,556,829.92	215.1	10.1	2,090,181.26	134.4	2.9	1,879,297.19	2,956,469.57	236.4		3,515,854.92	223.5	4.2	2,131,155.25	125.9	8.9	Ohio
Oklahoma	796,273.19	2,995,559.42	388.4	17.2	899,247.69	74.9	14.0	1,231,697.81	752,074.49	51.6	25.9	2,798,001.93	387.4	17.2	1,096,805.18	75.9	14.0	Oklahoma
Oregon	1,259,918.92	1,327,846.88	71.2	9.2	297,874.51	10.0		520,212.90	325,152.75	16.5	32.6	1,371,814.34	74.1	9.2	253,907.15	7.1		Oregon
Pennsylvania	2,604,752.38	4,331,545.30	253.7		2,306,599.06	147.0		2,645,815.10	2,447,671.94	165.5	3.0	4,877,487.77	299.7		1,760,759.59	111.0		Pennsylvania
Rhode Island	571,536.73	313,732.41	19.1		212,075.80	11.7		309,076.72	302,995.00	20.2		413,722.41	25.7		112,085.80	5.1		Rhode Island
South Carolina	154,169.43	2,632,353.00	254.9	129.5	377,000.00	36.4	43.9	848,892.94	1,225,544.77	79.1	7.7	2,354,774.28	248.9	102.2	644,578.72	42.3	71.1	South Carolina
South Dakota	971,357.97	2,151,823.85	560.4	157.0	291,577.40	111.9	41.8	891,393.35	578,550.24	232.0	55.5	2,200,751.50	692.2	170.1	252,549.55	80.1	28.7	South Dakota
Tennessee	565,933.64	3,128,728.14	210.8	23.8	1,570,655.03	53.5	84.3	585,283.53	1,590,594.54	96.3	36.5	2,753,784.10	193.1	23.8	2,045,599.07	71.2	84.3	Tennessee
Texas	6,027,171.16	5,821,784.61	443.8	211.0	1,547,193.95	118.8	122.3	3,389,352.72	4,643,158.82	374.0	178.4	6,258,093.73	467.9	254.8	1,110,884.84	94.7	78.5	Texas
Utah	303,090.94	1,645,530.18	129.8	14.4	528,044.95	54.2		1,024,716.70	1,170,032.08	132.9		1,605,440.88	135.4	14.4	668,134.25	48.5		Utah
Vermont	330,507.36	446,721.78	28.8		69,222.42	14.3		673,425.91	804,449.43	42.8		446,721.78	28.8		59,222.42	14.3		Vermont
Virginia	547,591.61	1,242,731.70	76.0	4.0	873,060.01	100.6	6.4	1,236,411.35	1,181,249.43	52.2		1,329,162.91	73.5	10.4	786,528.80	103.1		Virginia
Washington	743,430.84	1,097,600.00	80.3		989,236.89	53.0	23.1	464,106.00	1,343,714.32	65.3		1,508,600.00	99.1	18.1	578,236.89	34.2	5.0	Washington
West Virginia	709,717.23	1,895,230.41	175.7	4.0	134,375.62	11.1		1,036,614.60	1,626,871.73	111.1	8.0	1,882,155.92	175.7	4.0	147,450.11	11.1		West Virginia
Wisconsin	2,595,825.42	2,294,821.76	194.8	18.6	1,060,141.27	87.9	8.4	2,956,863.55	3,373,834.65	274.0	25.4	2,231,821.76	190.9	18.6	1,123,141.27	91.8	8.4	Wisconsin
Wyoming	428,263.76	1,402,994.39	215.7	63.4	397,060.17	61.9		859,750.63	1,072,604.63	104.5	55.7	1,255,385.29	203.5	63.4	534,669.27	74.1		Wyoming
Hawaii	1,121,742.78	239,100.89	12.3					303,720.29	373,119.33	20.6		239,100.89	12.3					Hawaii
TOTALS	73,976,067.24	122,610,155.64	11,315.2	1677.0	36,070,095.68	3,041.1	925.3	66,941,529.77	74,960,980.20	7,072.8	1795.5	123,162,376.04	11,604.4	1911.3	35,517,885.28	2,751.9	691.0	TOTALS

* Includes projects reported completed (final vouchers not yet paid) totaling: Federal aid, $ 32,558,784.76 Mileage: Original 2,968.0 Stage 609.0

PROGRESS OF FEDERAL HIGHWAY LEGISLATION

(NOT FOR RELEASE)

NEW BILLS INTRODUCED IN CONGRESS SINCE THE LAST ISSUE OF THE NEWS LETTER AND FURTHER ACTION ON BILLS PREVIOUSLY INTRODUCED ARE SUMMARIZED BELOW:

H. R. 383. - INTRODUCED IN THE HOUSE ON DECEMBER 5, BY C. C. DOWELL OF IOWA, AND REFERRED TO THE COMMITTEE ON ROADS: AUTHORIZES THE APPROPRIATION OF $75,000,000 AND $7,500,000, FOR FEDERAL-AID, AND FOREST ROADS, RESPECTIVELY, FOR EACH OF THE FISCAL YEARS 1930 AND 1931. REPORTED OUT, WITHOUT AMENDMENT, BY THE COMMITTEE ON ROADS, ON APRIL 12. S. 2327 PASSED IN LIEU THEREOF ON MAY 21, 1928.

H. R. 13111. - INTRODUCED IN THE HOUSE ON APRIL 17, 1928, BY R. G. SIMMONS OF NEBRASKA, AND REFERRED TO THE COMMITTEE ON ROADS: PROVIDES FOR THE AMENDMENT OF SECTION 6 OF THE FEDERAL-AID HIGHWAY ACT OF NOVEMBER 9, 1921, BY ADDING THE FOLLOWING LANGUAGE: "THAT WHERE NATIONAL CEMETERIES ARE NOT LOCATED ON THE SYSTEM OF FEDERAL-AID HIGHWAYS AS HEREIN DEFINED, THE SECRETARY OF AGRICULTURE SHALL HAVE AUTHORITY TO COOPERATE WITH THE STATE HIGHWAY DEPARTMENT OF THE STATE IN WHICH SUCH NATIONAL CEMETERY OR CEMETERIES ARE LOCATED IN CONSTRUCTING OR RECONSTRUCTING FEDERAL-AID HIGHWAYS TO CONNECT SUCH NATIONAL CEMETERY OR CEMETERIES WITH THE NEAREST FEDERAL-AID HIGHWAY."

H. R. - 13323. - INTRODUCED IN THE HOUSE ON APRIL 25, BY E. E. BROWNE OF WISCONSIN, AND REFERRED TO THE COMMITTEE ON ROADS, ON APRIL 25, 1928. THIS IS A MODIFICATION OF H. R. 10142 AS DESCRIBED IN THE FEBRUARY, 1928, NEWS LETTER. PROVIDES FOR THE CREATION OF A SPECIAL HIGHWAY FUND OUT OF THE PROCEEDS FROM THE SALE OF SURPLUS WAR MATERIAL, HIGHWAY EQUIPMENT, AND SUPPLIES TO THE GOVERNMENT OF FRANCE FOR WHICH THE UNITED STATES HOLDS BONDS TOTALLING $407,341,145. THE SPECIAL HIGHWAY FUND IS TO BE ADMINISTERED BY THE SECRETARY OF AGRICULTURE. NINETY PER CENT OF THE FUND IS TO BE APPORTIONED TO THE STATE HIGHWAY DEPARTMENTS, AS PROVIDED BY SECTION 21 OF THE FEDERAL HIGHWAY ACT OF 1921. ONE HALF OF THIS 90 PER CENT OF THE FUNDS IS TO BE USED ON THE EXISTING FEDERAL-AID HIGHWAY SYSTEM, AND THE REMAINING HALF ON LOCAL ROADS NOT ON THE PRESENT FEDERAL-AID SYSTEM. THE REMAINING 10 PER CENT IS TO BE SPENT AS FOLLOWS: ONE HALF FOR ROADS WITHIN THE NATIONAL FORESTS, AND ONE HALF WITHIN

THE REGIONAL AREA OF THE NATIONAL CAPITAL. IN THE CASE OF FEDERAL-AID ROADS, NO STATE SHALL BE REQUIRED IN ANY CASE TO PAY MORE THAN 20 PER CENT OF THE COST OF ANY HIGHWAY CONSTRUCTED IN ACCORDANCE WITH THIS ACT. THIS ACT IS NOT INTENDED TO REPEAL ANY PROVISION OF EXISTING FEDERAL-AID ROAD LEGISLATION UNLESS SUCH PROVISION IS IN DIRECT CONFLICT THEREWITH.

H. R. 13460. - INTRODUCED IN THE HOUSE ON MAY 1, BY H. R. RATHBONE OF ILLINOIS, AND REFERRED TO THE COMMITTEE ON ROADS. THIS BILL IS SIMILAR TO S. 1900 INTRODUCED IN THE SENATE ON DECEMBER 17, 1928, BY G. H. MOSES (FOR MR. DU PONT) OF NEW HAMPSHIRE: PROVIDES FOR THE ORGANIZATION OF A NATIONAL SURVEY COMMISSION FOR THE CONSTRUCTION OF A POST ROAD AND MILITARY HIGHWAY, FROM A POINT ALONG THE ATLANTIC SEABOARD TO THE PACIFIC COAST. THE RIGHT OF WAY IS TO BE 500 FEET WIDE. A STUDY AND REPORT IS TO BE MADE ON CERTAIN HIGHWAYS CONNECTING WITH THE CENTRAL SUPERHIGHWAY.

H. R. 13751. - INTRODUCED IN THE HOUSE ON MAY 14, BY H. R. RATHBONE OF ILLINOIS, AND REFERRED TO THE COMMITTEE ON ROADS. THIS IS A MODIFICATION OF H. R. 7016, AS DESCRIBED IN THE DECEMBER, 1927, NEWS LETTER: THE PRESENT BILL PROVIDES FOR THE SURVEY OF A ROUTE FOR A HIGHWAY CONNECTING CERTAIN PLACES ASSOCIATED WITH THE LIFE OF ABRAHAM LINCOLN. THE ROAD IS TO BEGIN AT HODGENVILLE, KY., AND PASS THROUGH INDIANA TO BEARDSTOWN, ILL.

H. J. RES. 256. - AUTHORIZES THE BUREAU TO MAKE A SURVEY TO DETERMINE THE COST OF CERTAIN BRIDGES ON UNITED STATES ROUTE 1, AND ITS EXTENSION FROM THE FLORIDA MAINLAND TO KEY WEST. THIS BILL WAS PASSED BY BOTH HOUSES OF CONGRESS AND SIGNED BY THE PRESIDENT ON MAY 16, 1928. IT IS NOW KNOWN AS PUBLIC RES. NO. 43.

H. J. RES. 259. - AUTHORIZES THE ASSISTANCE OF THE UNITED STATES GOVERNMENT IN THE CONSTRUCTION OF AN INTER-AMERICAN HIGHWAY IN THE WESTERN HEMISPHERE. THIS BILL WAS PASSED BY BOTH HOUSES OF CONGRESS AND SIGNED BY THE PRESIDENT ON MAY 4, 1928, AS PUBLIC RES. NO. 40.

S. 1182. - AUTHORIZES THE SECRETARY OF AGRICULTURE TO COOPERATE WITH THE STATE HIGHWAY DEPARTMENTS IN SELECTING AND ASSIGNING NAMES TO HIGHWAYS EMBRACED IN THE FEDERAL-AID HIGHWAY SYSTEM. THIS BILL PASSED THE SENATE, WITHOUT AMENDMENT, ON MAY 8, 1928, AND WAS REFERRED TO THE HOUSE COMMITTEE ON ROADS ON MAY 10.

S. 1341. - THIS BILL IS IDENTICAL WITH H. R. 5518 AS DESCRIBED IN THE DECEMBER, 1927, NEWS LETTER. IT PROVIDES FOR CERTAIN AMENDMENTS TO EXISTING FEDERAL-AID HIGHWAY LEGISLATION. AFTER BEING PASSED BY BOTH HOUSES OF CONGRESS, IT WAS SIGNED BY THE PRESIDENT ON MAY 21, 1928 AND IS NOW PUBLIC LAW NO. 458.

S. 1369. - THIS BILL IS IDENTICAL WITH H. R. 4625, AS DESCRIBED IN THE DECEMBER, 1927, NEWS LETTER. IT AUTHORIZES THE CONSTRUCTION AND MAINTENANCE OF A MEMORIAL HIGHWAY FROM THE NATIONAL CAPITAL TO MOUNT VERNON. THIS BILL WAS PASSED BY THE SENATE ON MARCH 6, AND BY THE HOUSE ON MAY 21, AND SIGNED BY THE PRESIDENT ON MAY 23, 1928, AS PUBLIC NO. 493.

S. 1900. - THIS BILL IS SIMILAR TO H. R. 13460 AS DESCRIBED ABOVE. IT WAS REPORTED OUT OF THE COMMITTEE ON POST OFFICES AND POST ROADS ON MAY 4, 1928, WITHOUT AMENDMENT.

S. 1945. - THIS BILL AS DESCRIBED IN THE DECEMBER, 1927, NEWS LETTER, AUTHORIZED APPROPRIATIONS FOR THE IMPROVEMENT OF RURAL ROADS OVER WHICH RURAL CARRIERS TRAVEL IN SERVING THE RURAL ROUTES, OTHER THAN THOSE NOW INCLUDED IN THE FEDERAL-AID ROAD SYSTEM. THIS BILL WAS REPORTED OUT BY THE COMMITTEE ON POST OFFICES AND POST ROADS WITH AMENDMENTS LIMITING THE APPROPRIATIONS TO $50,000,000 FOR EACH OF THE FISCAL YEARS 1931 AND 1932, ONLY.

S. 2327. - THIS BILL WAS REPORTED IN THE JANUARY, 1928, NEWS LETTER. IT AUTHORIZES THE APPROPRIATION OF $75,000,000 AND $7,500,000 FOR FEDERAL-AID AND FOREST ROADS, RESPECTIVELY, FOR EACH OF THE FISCAL YEARS 1930 AND 1931. IT PASSED THE SENATE, WITHOUT AMENDMENT, ON APRIL 16, AND THE HOUSE ON MAY 21, AND WAS SIGNED BY THE PRESIDENT ON MAY 26, 1928, AS PUBLIC NO. 519.

S. 2475. - THIS BILL WAS DESCRIBED IN THE JANUARY, 1928, NEWS LETTER. IT PROPOSES TO CREATE A PROSPERITY RESERVE AND STABILIZE INDUSTRY AND EMPLOYMENT BY THE EXPANSION OF PUBLIC WORKS, DURING PERIODS OF UNEMPLOYMENT AND INDUSTRIAL DEPRESSION. IT WAS REPORTED OUT BY THE COMMITTEE ON COMMERCE ON APRIL 18, 1928, WITH AMENDMENTS. IT NOW AUTHORIZES AN APPROPRIATION OF $75,000,000 FOR FEDERAL-AID ROADS. NO APPROPRIATION IS TO BE MADE IN PURSUANCE TO THIS ACT UNTIL THE PRESIDENT COMMUNICATES TO CONGRESS THAT THE VOLUME, BASED UPON VALUE, OF CONTRACTS AWARDED FOR CONSTRUCTION WORK IN THE UNITED STATES, HAS FALLEN 10 PER CENT FOR A THREE-MONTH PERIOD BELOW THE AVERAGE OF THE CORRESPONDING THREE-MONTH PERIODS OF THE PRECEDING THREE YEARS.

S. 3674. - This bill was described in the last issue of the News Letter. It amends existing Federal-aid road legislation and authorizes an appropriation of $3,500,000 for each of the fiscal years 1929, 1930, and 1931, for the construction of roads in the public-land States. This bill passed both Houses of Congress and was vetoed by the President on May 19, 1928. It was passed by the Senate over the President's veto, but the veto was sustained by the House on May 25, so that the bill fails to become a law.

S. 3874. - This bill was described in the last issue of the News Letter. It authorizes an appropriation of $1,943,200 for the construction of a highway from Red Lodge, Mont., to the boundary of Yellowstone National Park near Cooke City. It was reported out, without amendment, by the Committee on Post Offices and Post Roads, on April 25, 1928.

S. 4440. - Introduced in the Senate on May 3, by J. E. Watson of Indiana, and referred to the Committee on Post Offices and Post Roads. This bill is identical with H. R. 13323 as described above.

PROGRESS MAPS FOR 31 STATES NOW READY FOR DISTRIBUTION

CONTRIBUTED BY THE DIVISION OF DESIGN

(NOT FOR RELEASE)

MAPS SHOWING THE PROGRESS OF CONSTRUCTION ON THE FEDERAL-AID HIGHWAY SYSTEM IN 31 STATES ARE NOW READY FOR DISTRIBUTION. THESE MAPS ARE UNITS OF THE SERIES AUTHORIZED BY THE ACT OF CONGRESS OF NOVEMBER 9, 1921, WHICH CREATED THE FEDERAL-AID HIGHWAY SYSTEM. THE 59 SHEETS NOW OFF THE PRESS COVER THE FOLLOWING STATES:

ALABAMA	3 SHEETS	NEW JERSEY	1 SHEET
ARIZONA	2 DO	NEW MEXICO	2 SHEETS
COLORADO	2 DO	NEW YORK	3 DO
CONNECTICUT, MASSACHUSETTS, AND RHODE ISLAND	1 SHEET	NORTH CAROLINA	3 DO
DELAWARE AND MARYLAND	1 DO	NORTH DAKOTA	2 DO
FLORIDA	4 SHEETS	OHIO	2 DO
IDAHO	2 DO	OREGON	2 DO
ILLINOIS	3 DO	PENNSYLVANIA	2 DO
INDIANA	2 DO	SOUTH CAROLINA	2 DO
MAINE	2 DO	TENNESSEE	2 DO
MICHIGAN	4 DO	VIRGINIA	3 DO
MISSISSIPPI	2 DO	WASHINGTON	2 DO
NEVADA	2 DO	WEST VIRGINIA	2 DO
NEW HAMPSHIRE AND VERMONT	1 SHEET		

WHEN ALL THE MAPS ARE PRINTED, THE SET WILL TOTAL APPROXIMATELY 100 SHEETS, IN A UNIFORM SIZE OF 22 BY 31 INCHES. WHEN BOUND THEY WILL FORM A COMPLETE ATLAS OF THE FEDERAL-AID HIGHWAY SYSTEM. THE LOCATION OF THE ROADS IS PLOTTED AS CLOSELY AS THE SCALE OF THE MAP WILL PERMIT, AND THE TYPE OF CONSTRUCTION INDICATED IS BASED UPON THE LATEST ROUTE REPORTS SUBMITTED WITH THE FEDERAL-AID PROJECTS, AND THE MOST RECENTLY AVAILABLE LOG DATA. THE PLOTTED DATA, HOWEVER, ARE CONFINED EXCLUSIVELY TO THE APPROVED MILEAGE IN THE FEDERAL-AID HIGHWAY SYSTEM, AND THE MORE EXTENSIVE MILEAGE IN THE STATE AND COUNTY SYSTEMS IS NOT SHOWN.

Two scales have been used on the maps. The 1:500,000-foot U.S. Geological Survey base maps, prepared on a modified polyconic projection, were employed for all the States east of the public-land States, with the exception of Texas. The scale for the maps of the public-land States is 1:760,320 feet. Six different colors are used. Olive green indicates the county boundary lines and necessary culture; yellow represents Indian reservations; pink, military reservations and national monuments; and green, national forests. The unimproved sections of the Federal-aid highway system are designated by open parallel red lines, and unconstructed portions of forest highways on the Federal-aid system are shown by red parallel dashed lines. Portions of the Federal-aid system improved with Federal-aid are printed in solid red, and sections improved with State, or local funds are colored blue.

The type of construction is indicated by an initial letter, under the following classifications:

A. - Surfaces composed of asphalt or its derivatives, irrespective of the base, such as: Sheet asphalt, bituminous concrete, bituminous macadam, and all types included in the Bureau's code numbers 47 to 65.

B. - Surfaces consisting of block, brick, and all types included under the code numbers 80 to 99.

C. - Portland cement concrete, and all types included under code numbers 70 to 75.

E. - Earth roads, graded and drained, and all types included under code numbers 10 to 11.

G. - Gravel, and all types included under code numbers 30 to 37.

M. - Surface treated macadam, waterbound macadam, and all types, included under code numbers 40 to 46.

S. - Sand-clay, and all types included under code numbers 20 to 23.

THE PRELIMINARY WORK FOR 15 OF THE REMAINING STATES, AND ALSO REVISIONS FOR DELAWARE, MARYLAND, AND OHIO, HAS BEEN COMPLETED. IT IS EXPECTED THAT THESE MAPS WILL BE OFF THE PRESS AND READY FOR DISTRIBUTION BY JUNE 30. THERE IS NO SUITABLE BASE MAP FOR CALIFORNIA UPON WHICH THE SYSTEM DATA MAY BE PLOTTED. A NEW BASE FOR THIS STATE IS NOW BEING PREPARED BUT IT WILL NOT BE READY FOR DISTRIBUTION FOR SOME TIME. IT IS HOPED THAT THE MAP FOR THE REMAINING STATE - TEXAS - WILL BE OFF THE PRESS ABOUT AUGUST FIRST.

NOMOGRAPHS FOR PROPORTIONING CONCRETE MATERIALS

COMPILED FROM CHARTS AND DATA SUBMITTED BY A. F. HAELIG OF DISTRICT 7
(NOT FOR RELEASE)

THE ACCOMPANYING NOMOGRAPHIC CHARTS FACILITATE CONSIDERABLY THE DETERMINATION OF THE REQUIRED MATERIALS AND YIELD OF CONCRETE FOR KNOWN VOID CONTENTS IN THE FINE AND COARSE AGGREGATES. THE TWO DIFFERENT CHARTS FOR DETERMINING THE CUBIC FEET OF SAND PER BAG OF CEMENT INDICATE THE VARIATION IN THE RESULT CAUSED BY DIFFERENT BASES OF CALCULATION AND BY SLIGHTLY DIFFERENT ASSUMPTIONS IN THE QUANTITIES.

IN USING ANY OF THESE CHARTS IT IS NECESSARY THAT THE VOID CONTENTS OF BOTH THE FINE AND COARSE AGGREGATES SHALL BE KNOWN. A STRAIGHT EDGE PLACED ON THESE VALUES, WHICH ARE ON THE OUTER EDGES OF THE CHARTS, MAKES IT POSSIBLE TO READ THE OTHER DATA ON THE INTERMEDIATE GRAPHS, WITHOUT MOVING THE STRAIGHT EDGE.

ALL THE CHARTS REFER TO "DRY AND RODDED" MATERIALS, A CONDITION WHICH IS USUALLY CAPABLE OF ATTAINMENT ONLY IN THE LABORATORY. THE CHARTS WILL APPLY, HOWEVER, EQUALLY WELL TO FIELD CONDITIONS, USING DRY OR WET AND LOOSE MATERIAL, PROVIDED THAT THE VOID CONTENTS OF THE AGGREGATES IN THE CONDITION IN WHICH THEY ARE TO BE MEASURED, IS USED IN DETERMINING THE YIELD FOR ANY SPECIFIC CASE. CARE MUST BE USED, THEREFORE, NOT TO APPLY CALCULATIONS BASED ON DRY AND RODDED MATERIALS TO THE RESULTS OBTAINED IN THE FIELD, WITH THE MATERIALS IN ANOTHER CONDITION.

INFORMATION CONCERNING EACH GRAPH FOLLOWS:

CHART FOR DETERMINING THE DRY AND RODDED PROPORTIONS PER BAG OF CEMENT. - THIS NOMOGRAPH IS CALCULATED ON THE BASIS OF A CEMENT CONTENT OF 1.54 BARRELS PER CUBIC YARD OF CONCRETE, 5-1/4 GALLONS OF WATER PER BAG OF CEMENT, AND THE SAND CONTENT OF THE MIX IS TAKEN AT 1.25 TIMES THE VOLUME OF THE VOIDS IN THE COARSE AGGREGATE. IT IS BELIEVED THAT CONCRETE PROPORTIONED ON THIS BASIS SHOULD BE WORKABLE AND SHOULD YIELD COMPRESSIVE-STRENGTH-TEST VALUES OF OVER 3,000 POUNDS PER SQUARE INCH.

CHART FOR DETERMINING THE CUBIC FEET OF SAND REQUIRED PER BAG OF CEMENT. - THE SAND CONTENT OF A MIX WITH A CEMENT FACTOR OF 1.50 BARRELS PER CUBIC YARD OF CONCRETE MAY BE DETERMINED RAPIDLY FROM THIS CHART.

THE PROPORTIONS OF THE MATERIALS ARE CALCULATED UPON THE BASIS OF ONE BAG OF CEMENT TO 5-1/2 GALLONS OF WATER AND 3-1/2 CUBIC FEET OF COARSE AGGREGATE AND A VARIABLE AMOUNT OF SAND. THE VOLUME OF SAND, AS PLOTTED ON THE CHART, WAS DETERMINED BY SUBTRACTING THE SUM OF THE ABSOLUTE VOLUMES OF WATER, CEMENT, AND COARSE AGGREGATE, FOR A ONE-BAG BATCH, FROM THE SPECIFIED YIELD OF 4.50 CUBIC FEET. THE QUANTITIES PER CUBIC YARD ARE SIX TIMES THOSE INDICATED BY THE CHART, I.E., 6 BAGS OF CEMENT, 33 GALLONS OF WATER, 21 CUBIC FEET OF COARSE AGGREGATE, AND A VOLUME OF SAND EQUAL TO SIX TIMES THE CHART READING.

CHART FOR DETERMINING THE YIELD AND CEMENT FACTOR. - THE CALCULATIONS FOR THIS CHART ARE BASED UPON A $1:2:3\frac{1}{2}$ MIX BY VOLUME, USING DRY AND RODDED MATERIALS AND 5-3/4 GALLONS OF WATER PER BAG OF CEMENT. AS ONE-QUARTER GALLON OF WATER AFFECTS THE YIELD ONLY THREE-HUNDREDTHS OF A CUBIC FOOT, THIS CHART IS SUFFICIENTLY ACCURATE FOR ESTIMATING THE CEMENT REQUIREMENT OF THE ORDINARY $1:2:3\frac{1}{2}$ MIX USED IN CONCRETE-PAVEMENT CONSTRUCTION.

IN ADDITION TO BEING USEFUL FOR ESTIMATING PURPOSES, THIS CHART ILLUSTRATES THE EFFECT OF VOID CONTENT UPON YIELD. IT WILL SERVE TO IMPRESS BOTH THE CONTRACTOR AND ENGINEER WITH THE SAVING THAT MAY BE ACCOMPLISHED BY THE USE OF AGGREGATES WITH LOW VOID CONTENTS.

CHART FOR DETERMINING
DRY AND RODDED PROPORTIONS
PER BAG OF CEMENT

Using a cement factor of 1.54,
5-1/4 gallons of water per bag,
and a volume of sand equal to 1.25 times
voids in coarse aggregate.

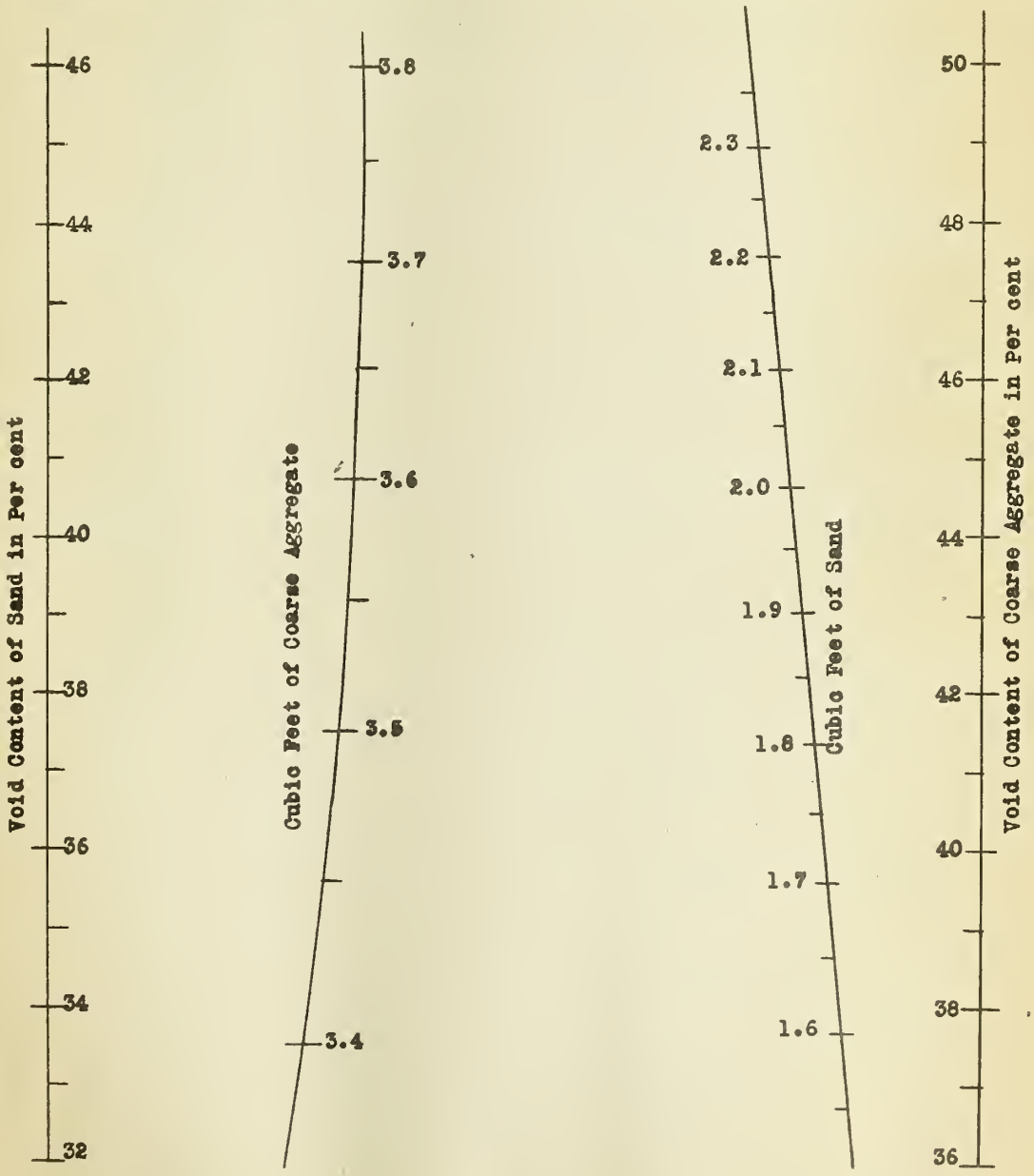


CHART FOR DETERMINING
CUBIC FEET OF SAND REQUIRED
PER BAG OF CEMENT

1:---:3½ Mix by Volume

Using Six Bags of Cement per Cubic Yard,
Dry & Rodded Materials and
5½ Gallons of Water per bag

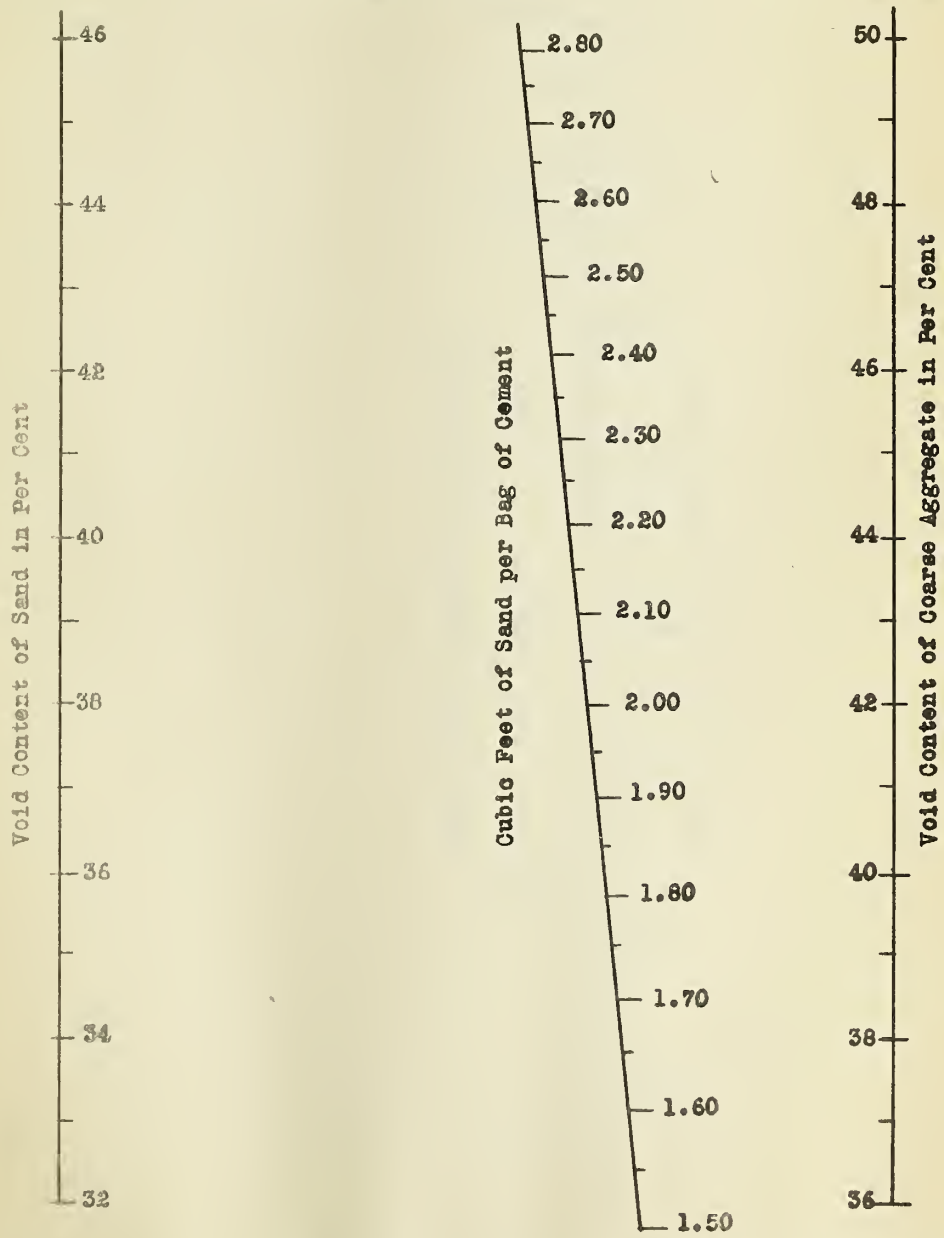
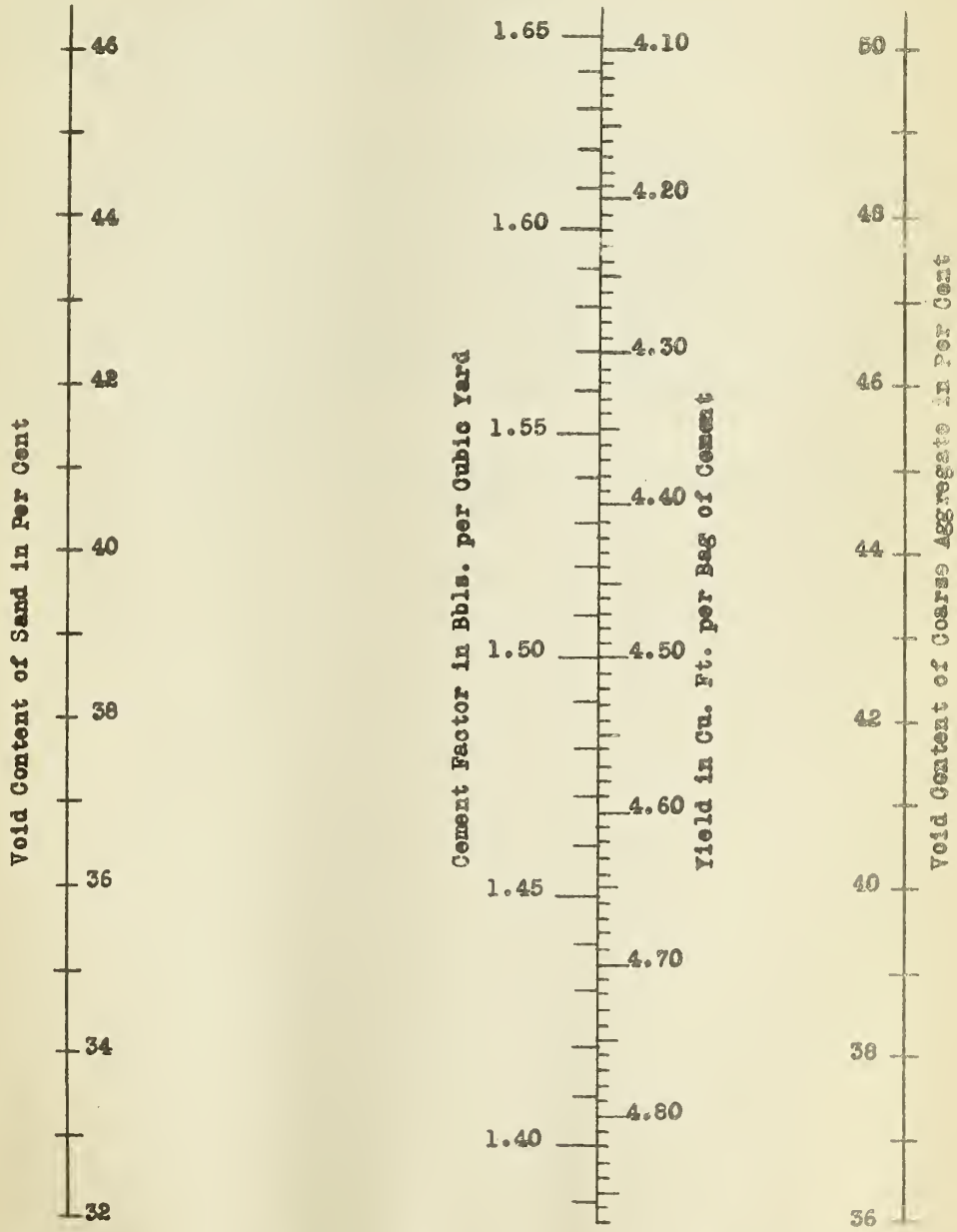


CHART FOR DETERMINING
YIELD AND CEMENT FACTOR

1-2-3½ Mix by Volume

Using Dry & Rodded Materials
And 5-3/4 Gallons of Water
Per Bag of Cement



STATE MATERIALS ENGINEERS IN DISTRICT 3 HOLD MEETING

CONTRIBUTED BY
F. H. JACKSON OF THE DIVISION OF TESTS
(NOT FOR RELEASE)

A MEETING OF THE STATE MATERIALS AND TESTING ENGINEERS IN DISTRICT 3, CALLED AT THE REQUEST OF THE DISTRICT OFFICE WAS HELD AT DENVER, COLO., ON MAY 9, 10, AND 11, 1928. THE MEETING WAS ATTENDED BY REPRESENTATIVES OF THE STATES OF COLORADO, NEW MEXICO AND WYOMING, AS WELL AS OF THE BUREAU.

THE PRIMARY PURPOSE OF THE MEETING WAS TO DISCUSS THE POSSIBILITY OF STANDARDIZING FORMS USED BY THE THREE STATES FOR REPORTING RESULTS OF TESTS OF ROAD MATERIALS. IT WAS FELT BY THE DISTRICT OFFICE THAT IF SOME STANDARDIZATION ALONG THIS LINE COULD BE EFFECTED IT WOULD GREATLY SIMPLIFY THE WORK OF REVIEWING THESE REPORTS IN THE DISTRICT OFFICE. ALTHOUGH SOME DIFFICULTIES WERE ENCOUNTERED IN EFFECTING A COMPLETE STANDARDIZATION, IT WAS FOUND POSSIBLE TO STANDARDIZE THOSE PORTIONS OF THE TEST REPORT FORMS GIVING THE IDENTIFICATION DATA RELATIVE TO THE MATERIAL.

THE FOLLOWING GENERAL FORM FOR TEST REPORTS WAS AGREED UPON:

REPORT OF TESTS OF (MATERIAL)

SUBMITTED BY _____	LABORATORY NO. _____
RES. ENGR. AT _____	PROJECT NO. _____
DATE SAMPLED _____	USED IN _____
IDENTIFICATION _____	QUANTITY REPRESENTED _____
SOURCE _____	LOCATION _____
BRAND _____	DATE _____

TEST RESULTS

(TO BE INSERTED)

REMARKS: _____

RECOMMENDATIONS: _____

APPROVED: TESTED BY:

MATERIALS ENGINEER LABORATORY ASSISTANT

THE STATE MATERIALS ENGINEERS ALSO DISCUSSED IN DETAIL THE VARIOUS MINIMUM REQUIREMENTS, RELATIVE TO TESTS OF MATERIALS, WHICH ACCOMPANIED THE MEMORANDUM OF THE CHIEF OF BUREAU DATED APRIL 1, 1928. CERTAIN DOUBTFUL POINTS WERE CLARIFIED AND A NUMBER OF ADDITIONAL REQUIREMENTS FOR SPECIFIC MATERIALS SUGGESTED BY THE DISTRICT OFFICE WERE INSERTED FOR USE IN DISTRICT 3.

THE REMAINING SESSIONS OF THE CONFERENCE WERE DEVOTED TO DISCUSSIONS OF METHODS FOR DESIGNING CONCRETE MIXTURES USING THE WATER-CEMENT-RATIO PRINCIPLE, AND THE CHARACTERISTICS OF ROAD OILS SUITABLE FOR USE IN THE OIL PROCESSING OF GRAVEL ROADS.

THE ABOVE BRIEF REPORT OF THE MATERIALS ENGINEERS CONFERENCE AT DENVER IS CALLED TO THE ATTENTION OF THE DISTRICT ENGINEERS WITH THE IDEA THAT CERTAIN OTHER DISTRICTS MIGHT POSSIBLY DESIRE TO CALL SIMILAR MEETINGS. THE DENVER OFFICE BELIEVES THAT THE RESULTS OBTAINED BY THIS SHORT CONFERENCE JUSTIFIED THE TIME GIVEN TO IT.

DEPARTMENT BULLETIN 1216 BEING REVISED

THE REVISION OF DEPARTMENT BULLETIN NO. 1216 "TENTATIVE STANDARD METHODS OF SAMPLING AND TESTING HIGHWAY MATERIALS" HAS BEEN SENT TO THE PRINTER AND AN EFFORT IS BEING MADE TO MAKE IT AVAILABLE AT THE EARLIEST POSSIBLE DATE. NO EXACT DATE CAN BE SET BUT IT IS HOPED THAT THE BULLETIN CAN BE DISTRIBUTED SOME TIME DURING AUGUST.

THE NEW EDITION WILL BE A CONSIDERABLY LARGER PUBLICATION THAN THE FORMER EDITION AND WILL CONTAIN ALL OF THE TEST METHODS ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS UP TO THE PRESENT DATE.